



How to start irrigating with less water

Viti-note Summary:

- After Harvest
- Budburst to Fruitset
- Fruitset to Veraison
- Veraison to Harvest
- Monitoring

Other topics in this Viti-Notes series include:

- *How to start irrigating with less water*
- An introduction to Regulated Deficit Irrigation
- Limitations of Regulated Deficit Irrigation
- Scheduling Regulated Deficit Irrigation
- Varietal responses to Regulated Deficit Irrigation

Before making any significant change to practices, it is important to prepare in the following manner:

- Identify soil types in the vineyard;
- Establish a means of monitoring moisture in patches of different soil (tools range from dig sticks to computerised moisture monitoring);
- Become familiar with growth stages.

THE FOLLOWING BROAD DESCRIPTION OF THE GRAPE PRODUCTION CYCLE AND WATER REQUIREMENTS WILL ASSIST WITH DECISION-MAKING ABOUT IRRIGATION TIMING AND THE AMOUNT TO APPLY.

After Harvest

- The vine may still be actively growing after harvest and building up reserves - a process that requires adequate moisture and nutrients.
- Consider a post-harvest irrigation.
- Monitor soil moisture throughout winter to ensure that the soil profile has good moisture levels going into budburst.

Budburst to Fruitset

Because soil moisture is normally high during this period in most regions—when winter and spring rains are adequate—it is usually neither possible nor desirable to apply a deficit strategy during the period.

Fruitset to Veraison

- From fruitset to veraison start by allowing that part of the soil profile that contains most of the feeder roots to dry by reducing or ceasing irrigation.

- Continue to dry the profile until vegetative growth slows or stops (indicated by monitoring data and visual inspections). Once this has been achieved, controlled irrigations can start again so long as vegetative growth is not re-stimulated.

Veraison to Harvest

- Moisture monitoring continues to be useful in the period from veraison to harvest to maintain moisture levels within a desired range to keep leaves in good condition.
- By checking the amount of applied water that goes past the rootzone, water use efficiency can be improved. If 10 % or less passes through, this is regarded as high efficiency.
- This regime should continue until harvest.

Monitoring

Familiarisation with soil moisture monitoring equipment and key visual signs exhibited by vines about their moisture requirements is vital. Soil moisture monitoring data shows changing patterns of moisture levels, the points of extraction from the profile and effects of rain and hot dry periods.

Vineyard inspections of general vine health, internode lengths and state of tendrils will assist decision-making. There are varietal differences, with Shiraz being quicker to show inactive tendrils than Cabernet Sauvignon at the same level of moisture deficit.

Scheduling of irrigations will be influenced by soil type (e.g. available water, infiltration rate, soil depth), weather (e.g. subsoil reserves after

winter, evaporation, rain events) and stage of growth.

Risks when attempting to reduce water application:

- Keeping soil too dry throughout the growing season will increase the risk of low yield and poor quality;
- Dry subsoil in winter and early spring can lead to poor budburst and variable yield;
- If the soil is too dry during flowering, this may lead to poor fruitset and low berry number per bunch;
- A late-season deficit just prior to harvest presents the risk of berry shrivelling and grapes not attaining optimum maturity;
- Timing is critical and it is important to consider scheduling based on monitoring and general water use efficiency;
- RDI is a specific practice at a specific time. It aims to enhance quality by controlling vine growth. Consequently, less water is used. Extreme deficits, however, are not advised.

Using RDI, a case study: Consider that there is a property in a hot inland region where application of 3 megalitres/ha or less will—according to local experience—risk a sustained setback. On this 20 hectare property, there are 15 ha of Shiraz and 5 ha of Cabernet Sauvignon. In former years, a uniform 6 megalitres per ha has been applied to the whole property (within a 120 megalitre allocation). With the onset of restrictions, of say 25%, there is now only 90 megalitres available. The manager may be tempted to ‘dry-grow’ the lower-priced Cabernet Sauvignon and allocate all 90 megalitres to the 15 ha of Shiraz so that the Shiraz gets the usual 6 megalitres.

However, this strategy may put the Cabernet Sauvignon at risk, and it would make more sense to use monitoring and scheduling to reduce the Shiraz allocation to 5 megalitres / ha—with no probable effect on yield—and provide the remainder to Cabernet Sauvignon at 3 megalitres / ha so as to achieve some yield but, more importantly, to reduce risk of long-term reduced capacity.

Acknowledgement

The Australian Wine Research Institute would like to acknowledge:

- Cooperative Research Centre for Viticulture (CRCV) and all involved in the VitiNotes series (1996 – 2006).
- Associate Professor Peter Dry (Viticulture consultant, The Australian Wine Research Institute) in the preparation of this document.

Further information

Nicholas, P. 2004. Soil, irrigation and nutrition. Adelaide: Winetitles.

Articles about Regulated Deficit Irrigation and other water management techniques are available to the Australian wine industry through the Australian Wine Research Institute library. Visit <http://www.awri.com.au/contact/> for details.

For information on drought management, go to Innovator Network Resources at www.gwrdc.com.au.

Product or service information is provided to inform the viticulture sector about available resources and should not be interpreted as an endorsement.



AWRI

www.awri.com.au

